

Bell Work: Pre AP
23-Aug-2017

Why is it important to be able to email a document to somebody, give two reasons that are not school focused?

EQ: If a student completes everything their teacher asks of them, homework, extra studying, participation in class, etc, should they be guaranteed a grade of A or B? Why?

Agenda

Metric System

Dimensional analysis recap

Syllabus

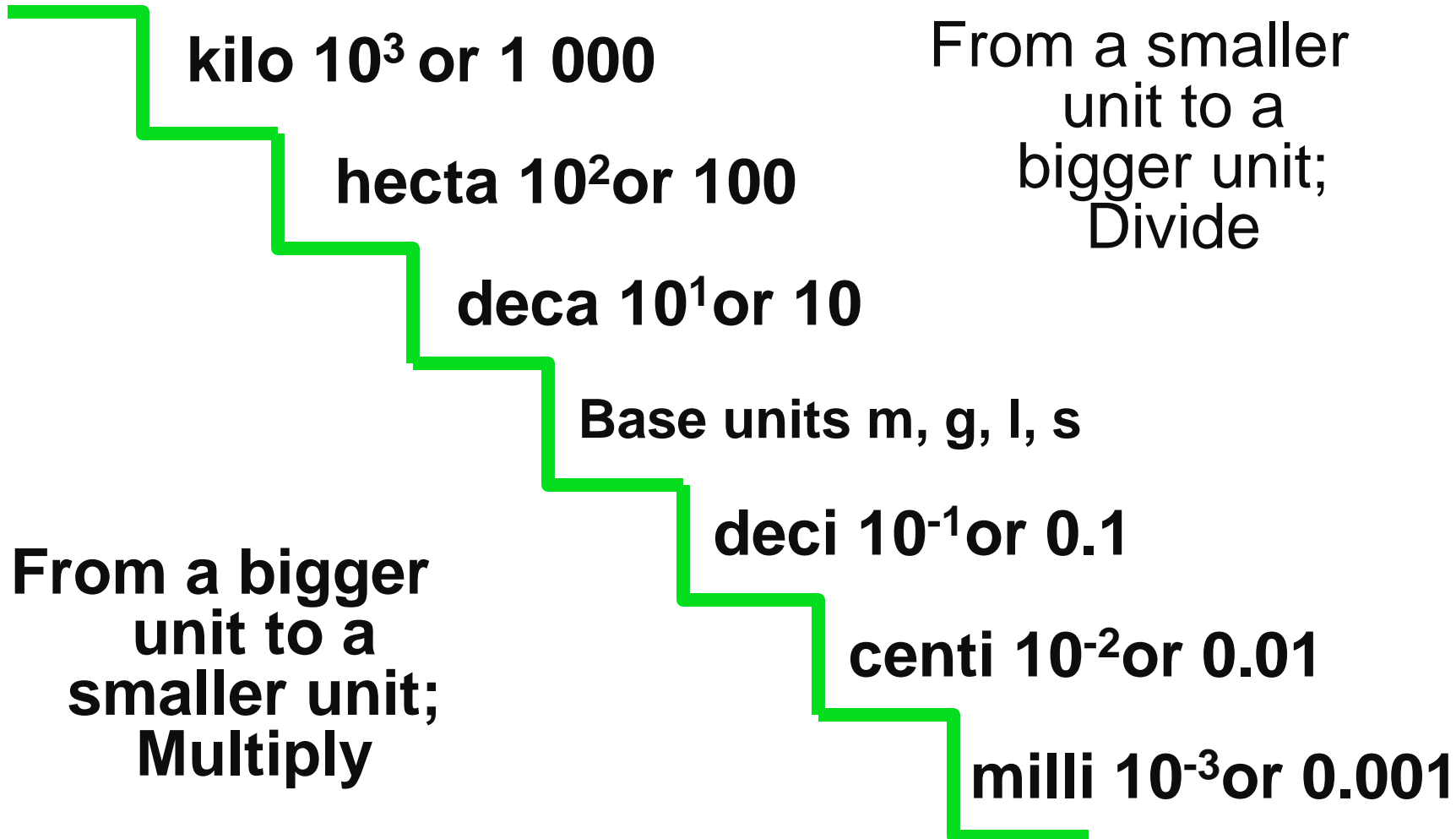
Objectives

Use dimensional analysis to convert units in the metric system

THE METRIC SYSTEM

<u>Metric (SI)</u>	<u>Unit</u>	<u>Standard System</u>
Meter (m) (mm,cm,km)	<u>Length</u>	Yard (inch, foot, mile)
Gram (g) (mg, µg, kg)	<u>Mass</u>	Pound (ounce, ton)
Celsius (°C)	<u>Temperature</u>	Fahrenheit (°F)
Liter (L) (mL, µL, kL)	<u>Volume</u>	Quart (tspn, tbl, cup, pint, gallon)
Second (s)	<u>Time</u>	Second (s)
Speed (m/s)	<u>Derived Units</u> <u>(Combination of Base Units)</u>	Speed (ft/s)

The Metric System



Converting in the Metric System: Dimensional Analysis

Moving the decimal place is helpful and fast, but not as useful as using dimensional analysis and conversion factors.

Ex. How many mm in 1m?

First – Determine what the conversion factors are, how are the two units related.

$$1000mm:1m$$

$$\frac{1000mm}{1m}$$

$$\frac{1m}{1000mm}$$

Converting in the Metric System: Dimensional Analysis

Ex. How many mm in 1m?

Second- Which conversion factor will let you cancel out the unit you have and end with the unit you want, when multiplying?

We want mm and need to cancel out m:

$$1\text{m} \times \underline{\quad ? \quad}$$

$$1000\text{mm} : 1\text{m}$$

$$\frac{1000\text{mm}}{1\text{m}}$$

$$\frac{1\text{m}}{1000\text{mm}}$$

Converting in the Metric System: Dimensional Analysis

Ex. How many mm in 1m?

Third – Set up the conversion and carry it out.

$$\cancel{1m} \times \frac{1000mm}{\cancel{1m}} = 1\ 000mm$$

Converting in the Metric System: Dimensional Analysis

You try: How many ml are in 3dl?

First - What is the relation ship between ml and dl,
and the possible conversion factors?

Second – which conversion factor will get give us
our desired unit?

Third – Cary out the conversion

$$3\cancel{dl} \times \frac{100ml}{1\cancel{dl}} = 300ml$$

Practice

How many mm are there in 2.1km?

Need to go from km to mm

km → base(meter) → deci → centi → milli

$$\begin{array}{r} 2.1\cancel{\text{km}} \times \underline{1\,000\,000\text{mm}} = \\ \phantom{2.1\cancel{\text{km}} \times } \cancel{\text{km}} \\ 2\,100\,000\text{ mm} \end{array}$$

Converting Metric Units

Making more from a larger number

Multiply by base 10 (number of spaces)

Ex. Convert 2.3 kg to g

$$2.3 \text{ kg} \times \text{______} \text{g} =$$

Ex. Convert 5.7 g to mg.

$$5.7 \text{ g} \times \text{______} \text{mg} =$$

The Metric System

Converting Metric Units

Making less from a number

Divide by base 10 (number of spaces)

Ex. Convert 1.5 g to kg.

$$1.5 \text{ g} \times \text{_____kg} =$$

Ex. Convert 8.2 mg to _____ g.

$$8.2 \text{ mg} \times \text{_____g} =$$

Dimensional Analysis

Start with
the value
and unit
you have

Choose a conversion factor
that allows you to cancel
out the starting (given) unit

$$\textit{given} \times \frac{\textit{desired}}{\textit{given}} =$$

Example: 4.5dm to km

$$4.5\text{dm} \times \frac{1\text{km}}{10000\text{dm}} =$$

Using Dimensional Analysis

If you have a 71in tall person,
how tall are they in cm?

**First: Find an equivalence
between in and cm, then write
the two conversion factors**

$$\frac{1\text{in}}{2.54\text{cm}}$$

or

$$\frac{2.54\text{cm}}{1\text{in}}$$

**Second: Pick the conversion factor that
lets you cancel out the given unit**

**Third: Carry out the
conversion**

$$71\text{in} \times \frac{2.54\text{cm}}{1\text{in}} =$$

LENGTH : Imperial to Metric

1 inch(in)	2.54cm	25.4mm
6 inches	15.24cm	152.4mm
1 Foot	30.48cm	304.8mm
1 Yard	91.44cm	914.4mm
1 Foot	30.48cm	0.3048m
6 Feet	182.88cm	1.828m
12 Feet	365.76cm	3.657m
30 Feet	914.40cm	9.144m
50 Feet	1524.00cm	15.240m

The Metric System

Practice problems – Convert using dimensional analysis.

550 millimeters to meters

3.5 moles to millimoles

1.6 kilograms to grams

2500 milligrams to kilograms

4.0 centimeters to millimeters

5 liters to milliliters

Before you Leave

What are four (4) metric prefixes you need to commit to memory?

Write out the step for using dimensional analysis on a scratch piece of paper.